(00057) The radial forces applied by the clamp bodies 84 to the riser pipe 28 in the direction of the riser pipe central longitudinal axis are depicted by arrows in Fig. 7. As also depicted by arrows in Fig. 7, the reactive forces applied by the engagement elements 62 against the outer base face 44 of yoke 34 are applied in parallel directions perpendicular to the clamping axis and the central longitudinal axis of the riser pipe 28. The radial forces are applied by the abutment surfaces 64 at the first and second radial locations on the riser pipe 28 symmetrical to the central longitudinal axis 31 of the riser pipe. The reactive forces are applied by the engagement elements 62 at the first and second locations on the yoke 34 symmetrical to the central longitudinal axis 31 of the riser pipe 28 and essentially diagonal to the opposite abutment surface 64. In other words, the radial force applied by the first clamp member 63 is applied at a location essentially diagonal to the location at which the reactive force is applied by the second engagement element 62, and the radial force applied by the second clamp member 63 is applied at a location essentially diagonal to the location at which the reactive force is applied by the first engagement element 62. The riser pipe 28 and the riser brace 32 are thusly clamped together between the abutment surfaces 64 which are forced against the riser pipe 28 and the engagement elements 62 which are forced against the outer base face 44 of yoke 34.

(00058) The clamp assembly 60 applies a compressive or radial preload between the riser pipe 28 and riser brace 32 which holds the riser pipe and riser brace together, particularly in the event that the weld 56 between the riser pipe and the riser brace fails.

The connecting member 82 carries compressive loads applied to the attachment members 61 and carries moment loads applied to the attachment members 61 and clamp members 63. The installation procedure may be inspected via a video camera and, when the appropriate attachment position and clamping position have been obtained, the connecting member 82 and the extension member 92 are crimp-locked and the clamp assembly 60 is left in place in the boiling water reactor as mechanically reinforcement for weld 56.

(00059) The clamp assembly 60 and the method of the present invention provide redundant structural support to the weld 56 between the riser pipe 28 and the riser brace 32. The clamp assembly 60 provides an alternate load path for loads from the riser pipe 28 to the riser brace 32 and ultimately to the reactor pressure vessel wall 12 or other attachment wall to which the ends of the riser brace 32 are attached. The present invention is particularly useful for repairing a cracked weld 56 between the riser pipe 28 and riser brace 32 and, in particular, cracking due to intergranular stress corrosion cracking. The apparatus and method of the present invention does not require electrode discharge machining or welding to secure the clamp assembly to the riser pipe and/or riser brace.

(00060) When the attachment members 61 are in the attached position on the riser brace 32, the attachment members 61 remain close to the outer peripheral portion of the riser brace 32 with only the engagement elements 62 and the first retaining walls 79 of

retaining members 78 protruding a minimal distance beyond the outer peripheral portion of the riser brace 32. The attachment members 61 protrude beyond the inner peripheral portion of the riser brace 32 only an insignificant amount at the inside corners where the side members 35 are joined to the yoke 34 of the riser brace. When the clamp members 63 are in a clamping position, the coupling portions 86 and the pivot portions 88 of the clamp bodies 84 are within the external perimeters of the corresponding attachment members 61 and only the lever arm portions 87 extend beyond the external perimeters of the attachment members. The lever arm portions 87 do not protrude beyond the outer peripheral portion of the riser brace 32 and, where the lever arm portions 87 protrude beyond the inner peripheral portion of the riser brace 32, the lever arm portions 87 follow the curvature of the riser pipe 28 and are close to the riser pipe 28. Accordingly, when the clamp assembly 60 is installed on the riser brace 32, the footprint of the riser brace is essentially maintained thusly minimizing extension of structural components of the clamp assembly beyond the footprint of the riser brace that could potentially interfere with jet pump mixers, other internals or equipment installed in the reactor pressure vessel for future repairs or inspections.

(00061) Inasmuch as the present invention is subject to many variations, modifications and changes in detail, it is intended that all subject matter discussed above or shown in the accompanying drawings be interpreted as illustrative only and not be taken in a limiting sense.